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(54) Title: AMPHOTERIC FLUORESCENT WHITENING AGENTS

(57) Abstract: The present invention provides novel bis-triazinylaminostilbene amphoteric fluorescent whitening agents, comprising both individual components and mixtures thereof, a process for their preparation, intermediates useful for their preparation and use of the fluorescent whitening agents for the fluorescents whitening of paper.

WO 2004/046293 A3

A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 C11D3/42	D21H21/30	C09K11/06	C07D251/68	D06L3/12
C07D251/50	C07D251/54	D06M13/358		

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)  
IPC 7 C11D D21H C09K C07D D06L D06M

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, CHEM ABS Data, WPI Data, PAJ

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	EP 0 850 934 A (CIBA GEIGY AG) 1 July 1998 (1998-07-01) claims 1-6; example 3 -----	1-3
Y	US 6 165 973 A (BAKER RICHARD LEON) 26 December 2000 (2000-12-26) claims 9,10,13,14,18; example 1 -----	6,12,15
Y	US 5 976 410 A (ROHRINGER PETER ET AL) 2 November 1999 (1999-11-02) claim 1; example 9 -----	6,12,15
A	US 5 976 410 A (ROHRINGER PETER ET AL) 2 November 1999 (1999-11-02) claim 1; example 9 -----	1-3,6
A	WO 02/055646 A (CLARIANT INT LTD ;TINDAL ALEC STEWART (GB); FARRAR JOHN MARTIN (GB) 18 July 2002 (2002-07-18) claims 1,2 -----	1-3,6

Further documents are listed in the continuation of box C.

Patent family members are listed in annex.

\* Special categories of cited documents :

- "A" document defining the general state of the art which is not considered to be of particular relevance
- "E" earlier document but published on or after the international filing date
- "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- "O" document referring to an oral disclosure, use, exhibition or other means
- "P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the International filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

"&" document member of the same patent family

Date of the actual completion of the International search

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# INTERNATIONAL SEARCH REPORT

International application No.  
PCT/EP 03/12583

## Box I Observations where certain claims were found unsearchable (Continuation of item 1 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1.  Claims Nos.: because they relate to subject matter not required to be searched by this Authority, namely:
  
2.  Claims Nos.: because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:
  
3.  Claims Nos.: because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

## Box II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

see additional sheet

1.  As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.
  
2.  As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
  
3.  As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:
  
4.  No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

1-3, 6, 12, 15(part)

### Remark on Protest

- The additional search fees were accompanied by the applicant's protest.  
 No protest accompanied the payment of additional search fees.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. claims: 1-3, 6, 12, 15 (part)

Fluorescent whitening agent comprising a mixture of the compounds (1a), (1b), (1c), or (1d), (1e), (1f), or (1d), (1g), (1h) as disclosed in claims 1-3; a process for the preparation of a mixture of the compounds (1a), (1b), (1c) as disclosed in claim 1; use of the mixture of the compounds (1a), (1b), (1c) for the fluorescent whitening of paper; and paper, which has been treated with a fluorescent whitening agent comprising a mixture of the compounds (1a), (1b), (1c).

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2. claims: 4, 7, 13, 15 (part)

A compound of the formula (2) as disclosed in claim 4 and method of its preparation as disclosed in claim 7; use of a compound of formula (2) for the fluorescent whitening of paper; and paper, which has been treated with a fluorescent whitening agent comprising a compound of formula (2).

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3. claims: 5, 8

A compound of the formula (3) as disclosed in claim 5 and method of its preparation as disclosed in claim 8.

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4. claims: 9-11

A compound of the formula (4a) or a mixture comprising compounds of the formulae (4a), (4b) or (4c) as disclosed in claim 9 and method of their preparation as disclosed in claim 10; use of a compound of the formula (4a) for the preparation of a compound of formula (2).

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5. claims: 14, 15 (part)

Use of a compound of formula (5) as disclosed in claim 14 for the fluorescent whitening of paper; paper, which has been treated with a fluorescent whitening agent comprising a compound of formula (5).

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## Information on patent family members

Final Application No

EP 03/12583

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